Lidar remote sensing of vegetation biophysical parameters at multiple scales: terrestrial, airborne, and spaceborne perspectives

Dr. Sorin Popescu

The use of lidar remote sensing for mapping the spatial distribution of vegetation canopy characteristics has the potential to allow an accurate and efficient estimation of tree dimensions and canopy structural properties from local to regional and continental scales. The overall goal of this presentation is to discuss lidar remote sensing of forests at multiple scales when using data collected from terrestrial, airborne, and satellite platforms. The presentation explores data lidar data types and the integration of data from different platforms to improve our understanding of capabilities and limitations of each data type. The presentations discusses algorithms and processing methods in the context of various applications ranging from individual tree measurements, forest biomass estimation, brush biomass estimation for bioenergy use, LAI and canopy cover estimation, multi-temporal lidar data sets and vegetation change detection, and forest fuels and fire risk mapping. In addition, the presentation includes a comparison of biomass estimates and height metrics obtained by processing GLAS waveform data and spatially coincident discrete-return airborne lidar data over forest conditions in east Texas.